

REMARKS

Applicants have amended the claims in response to the Office Action of January 12, 2005 to correct the informalities noted by the Examiner. In particular, claims 6 and 7 have been amended to overcome the lack of antecedent basis noted by the Examiner. In light of these amendments, it is respectfully submitted that the rejections of claims 6 and 7 35 USC 112, second paragraph, have been overcome and it is respectfully requested that such rejections be withdrawn.

The Examiner has rejected claims 1-20 under 35 USC 103(a) as being unpatentable over DeYoung et al in combination with Nishio. The Examiner cites DeYoung et al as disclosing a process and apparatus for cleaning semiconductor wafers using dense carbon dioxide. However, the Examiner recognizes that DeYoung et al does not teach use of a bellows accumulator as presently claimed. Therefore, the Examiner relies on Nishio for disclosure of a bellows type pump and accumulator used to transport chemical liquid for various processes, including washing liquid crystal displays. The Examiner then concludes that it would have been obvious "to use the accumulator taught by Nishio instead of the pressure vessel taught by DeYoung et al to obtain the claimed process and system, and to improve the cleaning process". The Examiner reaches this conclusion "because both accumulator and pressure vessel [are] used to elevate the pressure of the cleaning component". In addition, the Examiner suggests that it would have been obvious "to adjust the flow rate to obtain the component velocity as claimed", but does not cite any prior art in support thereof. These rejections are respectfully traversed and it is respectfully submitted that the present claims are patentably distinct from DeYoung et al in combination with Nishio.

Initially it is respectfully submitted that in order to support a conclusion that a claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teaching of the references. (See Ex parte Clapp, 227 USPQ 972; PTO Bd of APP INT, 1985.) Further, applicants respectfully submit that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. (See ACS Hospital Systems, Inc. v. Montefiore Hospitals, 221 USPQ 929; Fed Cir. 1984.)

In this light, it is respectfully submitted that DeYoung et al and Nishio clearly fail to expressly or impliedly suggest combination. Further, the Examiner has failed to provide a convincing line of reasoning that supports the combination. In particular, it is clear that neither DeYoung et al nor Nishio expressly or impliedly suggests combination. In fact, the two references are directed to very different technologies that makes the supposed combination extremely unlikely. In this light, DeYoung et al relates to method of cleaning microelectronic structures, while Nishio is directed to reducing pulsation in a bellows type pump. It may be true that the Nishio pump could be used in a surface cleaning system, but such use hardly supports the combination suggested by the Examiner. The mere fact that both the DeYoung et al and Nishio systems employ some type of pressure device falls well short of providing the necessary incentive for combination.

Further, even if the references could be combined as suggested by the Examiner, it is respectfully submitted that such combination would not render the present invention obvious. In this light, the Examiner has recognized that DeYoung et al fails to teach or suggest the use of a bellows accumulator. It is respectfully submitted that replacing the vessel of DeYoung et al with the bellows type pump of

Nishio would actually render the DeYoung et al apparatus and method inoperable. In particular, the cleaning process of DeYoung et al, as well as that of the present invention, requires elevated pressures of the cleaning components. Conversely, Nishio discloses use of either a bellows type pump or a bellows type accumulator employed as a pulse dampener to convey a low pressure fluid in a chemical process. The bellows type pump of Nishio is incapable of pumping fluids to high pressure for a number of reasons. In particular, excessive force would be required to move the piston rod 13 if high pressures were present in bellows 7. In addition, the bellows 7 is required to be easily deformable and therefore incapable of containing high pressure without balancing high pressure fluids outside of the bellows 7. Clearly, Nishio does not disclose such an arrangement. Therefore, one skilled in the art would simply have no reason to look to Nishio, a low pressure system, as a possible combination with DeYoung et al, a high pressure system. Further, even if combinable, such combination would not render the present invention obvious, but would rather result in an inoperable system.

In the Office Action of 12 January 2006, the Examiner found the above argument to be unpersuasive, and concludes that it would have been obvious to "use pressure to discharge the liquid from the bellows toward the surface to be cleaned" and to "adjust the pressure in Nishio by using a pressure regulating mechanism". To support these comments, the Examiner points to Nishio, Col 4, lines 5-14 and Col 12, lines 22-50. The Examiner also finds that the combination of references is suggested, because the "pressure as claimed (elevated pressure) could read on pressurizing the bellow to discharge the liquid toward the surface to be treated" and that "all references are from the same technical endeavor, which is using densified (e.g. liquid or supercritical) carbon dioxide cleaning composition for cleaning a surface of a substrate under pressure".

These further statements of the Examiner have been carefully considered and it is respectfully submitted that such statements do not further the Examiner's rejection and in fact contain several errors. Initially, the Examiner's statements concerning using pressure to discharge liquid toward a surface to be cleaned and adjusting the pressure are not fully understood. Contrary to the Examiner's assertions, there is nothing in Nishio that suggests discharging liquid toward the surface to be cleaned. Rather, the Nishio apparatus includes a liquid outflow passage (6, Fig. 1) that is connected to a discharge check valve (21, Fig. 1) having further components associated therewith. Further, there is no suggestion of a pressure regulating mechanism whatsoever, even in the passages specifically cited by the Examiner. Rather, these passages refer to the expansion and contraction of the bellows and includes only a description of the arrangement being able to prevent over extension of the bellows.

The Examiner's statements regarding the claims elevated pressure are as clear an example of the use of improper hindsight as can possibly be found. In particular, the Examiner specifically states that he is relying on the disclosure of the instant invention for determining limitations or features of the prior art reference. In addition, the Examiner is simply wrong about the references being in the same technical endeavor. Nishio simply does not refer to the use of carbon dioxide (liquid or supercritical) in any way. Therefore, the Examiner's basis for combination is flawed and improper.

As noted in the previous response, it appears that the Examiner is asserting that the adjustment of flow rate to obtain component velocity as claimed in the instant claims would be "well known" or a "matter of common knowledge". Further, the Examiner appears to be suggesting that the particular velocities claims would be "well known". This assertion is respectfully traversed, and it is respectfully submitted that the Examiner has failed to meet the "substantial evidence" standard (see

MPEP 2144.03) that requires the facts asserted to be well-known be capable of instant and unquestionable demonstration as being well-known. It is not appropriate for the Examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known, as is the case here. It is clear that the specific velocities of the present claims is not well known, but rather a specific dependent limitation appropriate for the present invention. If the Examiner continues to apply this rejection, it is respectfully requested that the Examiner provide documentary evidence supporting this allegation as required by MPEP 2144.03.

The Examiner has made no specific response to the above in the Office Action of 12 January 2006. Therefore, the request is herein repeated.

In light of the above, it is respectfully submitted that present claims 1-20 are patentably distinct from DeYoung et al in combination with Nishio and it is respectfully requested that the rejection of such claims under 35 USC 103(a) be withdrawn.

The Examiner has also rejected claims 1-2, 5, 8-19 and 20 under 35 USC 103(a) as being unpatentable over Barton in combination with Nishio. The Examiner indicates that Barton discloses a process and system for cleaning semiconductor wafers, but again notes that Barton fails to teach the bellows accumulator as required by the present claims. Therefore, the Examiner again relies on Nishio for teaching a bellows accumulator for the same reasons as set forth with respect to claims 1-21 and the combination with DeYoung et al noted above. These rejections are traversed and it is respectfully submitted that the present claims are patentably distinct from Barton in combination with Nishio.

The Barton system uses three ballast tanks 36, 38, and 40 that are simple vessels periodically refilled with the dense phase fluid and fluid modifier. Such simple vessels are sufficient in Barton because there is no capability to maintain constant pressure in the process vessel of Barton. In fact, it is actually intended to be able to change the pressure in the process vessel. As noted above, Nishio relates to a low pressure system. There is simply no reason why one skilled in the art would look to Nishio for combination with Barton, and clearly the Examiner has failed to meet the burden necessary for establishing such a combination. The Examiner's statements that "simply alternating choice of tank because Barton discloses that to render the process as continuously efficient as possible ..." fails well short of this burden and in fact makes little if any sense. It is completely unclear why or how the bellows pump of Nishio could be substituted for the ballast tanks of Barton and it is respectfully submitted that such substitution would at best defeat the purpose of the Barton system.

The Examiner has made no specific response to the above arguments in the Office Action of 12 January 2006. Therefore, the arguments are repeated and maintained. As noted above, at the very least, the Examiner's apparent basis for combination, i.e. that both references relate to the same technical endeavor has been shown to be inaccurate, thus rendering this combination of references improper.

It is respectfully submitted that present claims 1-2, 5, 8-19 and 20 are patentably distinct from Barton in combination with Nishio and it is respectfully requested that the rejection of such claims under 35 USC 103(a) be withdrawn.

In light of the above amendments and remarks, it is respectfully submitted that the present application is in condition for allowance and further action consistent therewith is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'David A. Hey', with a stylized flourish at the end.

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